

EVERGREEN

The Magazine of The Evergreen Foundation • January 1998

Forests and Forestry In
Indiana
*Answers to Questions
of Public Interest
and Concern*

TOURING AMERICA FOR FORESTRY

In this issue, we write about forests and forestry in Indiana—yet another stop on our two-year long tour of American forests.

Indiana's forests are among the most productive in the central hardwood region, and its now global hardwood manufacturing industry contributes more than \$2.5 billion a year to the state's economy. But this state's forests are under increasing pressure. Urbanization, which often leads to the permanent removal of forests, poses the greatest threat. Harvesting levels are increasing too, a result of increasing worldwide demand for products made from fine quality hardwood, an Indiana staple.

To protect Indiana forests, the state's Division of Forestry is partnering with private landowners and loggers, promoting environmentally sensitive harvesting practices and long term investments in science-based forestry. So, too, are the state's forest products manufacturers, who clearly have much to gain from keeping Indiana's forests healthy and productive.

Indiana's forestland base is again expanding, after contracting for more than 100 years, but there are un-answered questions—matters of public interest and concern—about the overall welfare of the state's forests. Among the most frequently asked questions: *Are we harvesting more trees than we are growing? Does harvesting hurt wildlife? And is the forest products industry important to Indiana's economy?* This booklet answers these and other important questions of public interest.

Here are the main points we cover in this issue, summarized for those who do not have time to read the entire report in one sitting.

Forests in Indiana cover 19 percent of the state's land base, some 4.4 million acres. But as recently as 1800—before clearings for agriculture, community development and transportation systems began—forests blanketed 85 percent of the land base that became Indiana. By 1860, Indiana looked very much like it looks today.

There are 13 forest types in Indiana, but oak-hickory forests dominate, covering 32 percent of the state's forestland base. Maple-beech forests, which are expanding their range, cover another 20.6 percent. Hardwoods account for 96 percent of Indiana's forest. (See Fig. 7, Page 9).

Most forestland in Indiana is privately owned, by approximately 100,000 different landowners. The fact that there are so many owners poses a major challenge for the Indiana Division of Forestry. The Division is sponsoring several initiatives designed to persuade landowners to keep their woodlands forested. Farmers own more of Indiana's forest than any other landowner group, some 1.7 million acres.

Indiana's forestland base has expanded by about 430,000 acres since 1917. Early recognition of the importance of Indiana's forests led to enactment of the state's **Classified Forest Program**, a 77-year-old initiative that gives forest landowners property tax incentives if they keep their woodlands forested.

About 52 percent of Indiana's forests are less than 50 years old. Much of what can be seen today grows on cropland that was naturally recolonized by hardwoods after farming ceased—a tribute to the remarkable resiliency of forests.

Forest growth still exceeds harvest by a comfortable margin, though it has narrowed in recent years, a result of

increasing global demand for products made from Indiana hardwood.

Growing stock volume and saw-timber volume both increased dramatically between 1967 and 1986, the year the U.S. Forest Service completed its last major study of Indiana forests. An updated study is due in 1998. Volume increases re-corded

in 1987 reflect a maturing of the state's highly productive forests.

Harvesting does not appear to have an adverse impact on wildlife species. In fact, about 70 percent of all wildlife species living in the central hardwood region require the kinds of habitat that are found in forests less than 40 years old. Such forests are often the result of management, including periodic harvesting.

Indiana's forest products industry contributes \$2.552 billion a year to the state's economy, on worldwide sales of \$5.777 billion.

Of 56,600 people working in Indiana's timber industry, almost 86 percent work for secondary manufacturers, including furniture and cabinet makers and companies that manufacture flooring, doors, window frames, millwork, pallets and hundreds of other structural and decorative products made from hardwood.

Indiana's economy is diverse and growing rapidly; but **many southern counties are still more than 50 percent dependent on revenues and wages generated by forest products manufacturers.**

This was our third trip to Indiana, and we want to thank those who made us feel at home again. Among them, Dan Cassens, Purdue University; Lenny Farlee, Indiana Division of Forestry; Vicki Carson, Indiana Hardwood Lumbermen's Association; and our old friend, Ray Moistner, Indiana Lumber and Builder's Supply Association, who years ago introduced us to Indiana University basketball. Now we are big fans.

Onward we go,
Jim Petersen, **Editor**



How big are Indiana's forests, and who owns them?

Indiana's forests span 6,875 square miles, or about 19 percent of the state's total land base. In acreage terms, forests cover 4.4 million of the state's 23.2 million acre land base. About 87 percent of these forests are privately owned. The rest is publicly owned by state, federal or muni-cipal unit of government.

(Fig. 1)

Farmers own about 1.7 million acres of private forestland in Indiana, while individuals not involved in farming own another 1.62 million acres.

Corporations engaged in forestry and wood products manufacturing own some 425,000 acres. In all, there are about 100,000 private forest landowners in the state. About 25,000 own tracts smaller than 20 acres. Another 25 percent own 21-50 acre tracts, and about 50,000 own tracts larger than 50 acres. Many forest land-owners have no interest in timber production, while others report it is their main source of income.

Approximately 537,000 acres of Indiana forestland are publicly owned: 196,000 acres are held in national forests; 150,000 are in state forests and 191,000 are in other public ownerships, including military bases, fish and wildlife areas and state parks.

Of Indiana's 4.4 million acres of forestland, 4.3 million acres are classified as *timberland*—forestland capable of growing at least 20 cubic feet of industrial wood per acre per year. But much of the state's timberland base is far more productive. The U.S. Forest Service estimates net growth per acre *could be doubled*—from 36 to 77 cubic feet per acre per year—if more landowners could be persuaded to make long-term investments in science-based forestry.

For monitoring purposes, state and federal agencies group Indiana's forests into four Survey Units: Knobs, Northern, Lower Wabash and Upland Flats (**Fig. 2**) Perry, Harrison, Brown and Orange counties (Knobs Unit); and Martin County (Lower Wabash Unit), are the state's most heavily timbered counties. Each is more than 50 percent forested. Most of Indiana's forests grow south of Indianapolis. At 1.7 million acres, the Knobs Unit is the largest, and it holds 45 percent of all growing stock volume in the state. Together, the Knobs Unit, the 900,000-acre Lower Wabash Unit and the 600,000-acre Upland Flats Unit contain 74 percent of the state's *timberland* and 76 percent of its *growing stock volume*.



How have Indiana's forests changed since settlement began?

Historic and scientific records indicate forests covered 85 percent of the state of Indiana in the early 1600s, about the time European settlement began on the eastern seaboard. **Figure 3** tracks Indiana's forestland base from 1630 to present day.

As recently as 1800, Indiana's land base included about 20 million acres of forest, two million acres of prairie, 1.5 million acres of wetlands and slightly more than one million acres of glades, barrens, swamps and savannas.

But by 1860, Indiana looked very much like it looks today. Some 16 million acres of forest had been felled or burned to make way for croplands, communities or transportation routes. All 92 counties were established, and the state's population stood at 1.35 million. Roads, railroads, canals and telegraph lines criss-crossed the state.

Early timber harvests filled a wide variety of pioneer needs: fencing material, fuelwood for cooking and heating, planks for flatboats, telegraph poles, charcoal for steel making, railroad ties, bridges, furniture, fuel for steam engines, and, of course, structural building material. In 1899, Indiana led the nation in lumber production—1.037 billion board feet, more than twice the 1991 production.

In 1922, Indiana State Forester, Charles Deam, predicted the state would be treeless in 15 years. Fortunately, he was wrong. But it was he who first envisioned Indiana's Classified Forest Program, which provides tax incentives for landowners who keep their woodlands forested. Thanks in part to his vision, Indiana's timberland base has expanded from 1.66 million acres in 1917 to about 4.4 million acres today.

Taken in total, the recovery of Indiana forests is a tribute to nature's resiliency, advancements in forestry and the public's desire to conserve forests. No where in Indiana are these contributions more in evidence than in the Hoosier National Forest, which grows mainly on farmland abandoned early in this century.

Although European settlement had a significant impact on Indiana forests, the forests that grew here before white settlement began were not undisturbed wildernesses. Written records dating to the early 1600s describe widespread Indian settlement, and an advanced agricultural society based on cultivation of beans, peas, squashes, pumpkins, melons, tobacco and corn.

To clear their croplands and to keep forests from reentering clearings, Indians routinely burned timber stands. Crops were then planted between large, standing dead trees. Burning was also used to stimulate prairie grass production, which attracted buffalo, deer and elk, which Indians hunted. But without fertilizer to maintain soil productivity, Indian agriculture was not sustainable. Tribes were forced to move on every few years. New clearings were opened, and forests reestablished themselves in abandoned clearings.

Early white settlers also used fire to clear away forests. Before 1860, there was little demand for timber. Millions of acres of trees were simply rolled into piles and burned. One account describes a scene far different from contemporary Indiana. It was written in November, 1819 by Richard Lee Masgave, who was traveling between Vincennes and New Albany. "Traveled six miles to breakfast and to entertain an idea of starving. No water. No food fit to eat, dusty roads and constantly enveloped in a cloud of smoke, owing to the woods and prairies being on fire for 100 miles."



What are Indiana's forests like today?

Figure 4

Indiana's forests are beautiful, productive and biologically diverse. About 52 percent of the state's forests are less than 50 years old, and much of it grows on croplands that were abandoned early in this century. The fact that hardwoods naturally recolonized these old fields is a tribute to their resiliency.

Hardwoods cover almost 96 percent of Indiana's forestland base. Oak, hickory, hard maple, yellow-poplar and soft maple are the most common of more than 80 hardwood tree species that grow in the state. Although not widespread, softwood pines are increasing their range, mainly in the southern part of the state, where they grow on plantations that occupy farmlands abandoned years ago. Of five pine species, Virginia and white pine are the most abundant.

There are 13 *forest types* in Indiana, but four are clearly dominant. Oak-hickory forests cover 32 percent of the state's forestland base; maple-beech forests cover 20.6 percent; elm-ash-soft maple forests cover 14.8 percent; and cherry-ash-yellow-poplar forests cover 11.7 percent. The map (**Fig. 7**) on Page 9 shows the current distribution of tree species. It was created by the U.S. Forest Service, using satellite tracking data and on-the-ground surveys.

Since 1950, the condition of Indiana forests has been assessed three times by the U.S. Forest Service Forest Inventory and Analysis (FIA) Group. A new FIA analysis is expected in 1998.

The most recent Forest Service assessment covered the years 1967 to 1986. It revealed the state's forests were in remarkably good condition, especially considering the enormous environmental pressures posed by urban expansion, increasing recreational demand and increased harvesting activity. Among the report's findings:

- **Forestland acreage increased by 400,000 acres**
- **Growing stock volume increased 43 percent** to 5.2 billion cubic feet (**Fig. 4**)
- **Sawtimber volume increased 54 percent**, from 12.5 to 19.2 billion cubic feet
- **Growing stock tree numbers increased 21 percent**, from 311 to 393 million
- **The area of timberland occupied by sawtimber increased 36% (Figs. 5-6)**, but the area occupied by poletimber and sapling-seedling-size stands declined, a result of the maturing of forests
- **Sawtimber quality has declined**, a presumed result of historic emphasis on harvesting larger trees. However, current landowner interest in improving the quality of younger timber stands holds the promise of improving sawtimber quality in years to come.
- **Oak-hickory forests accounted for 30 percent of growing stock volume** (1.6 billion cubic feet) but were giving way to expanding maple-beech forests, a natural result of plant succession, and a further result of the enormous popularity of oak cabinetry, flooring and furniture. Even so, there are still many more oak forests in Indiana today than there were a hundred years ago—a result of the fact sun-loving oaks quickly recolonized abandoned farmlands and cutover timberlands harvested 60–80 years ago.
- **Timber harvesting increased 43 percent**, to 93 million cubic feet in 1986. Oak harvesting accounted for 45 percent of total growing stock harvests, a 70 percent increase from 1966.



Is it necessary to “manage” Indiana’s forests? Wouldn’t it be better to let them grow naturally?

No, it is not necessary to manage Indiana’s forests, but there is one compelling reason why they should be managed. Put simply, nature is indifferent to human need.

Indiana’s commercial forests, its state parks and wildlife preserves—even the Hoosier National Forest, which grows mainly on abandoned farmland—are all products of human needs that could not have been met if the land had been left to nature.

Many people believe forests that are left to nature never change, but forests change constantly in ways that are often difficult to predict. A sudden wildfire, a tornado or a disease or insect infestation can spoil the appearance and productivity of a forest for decades, without regard for public want or need.

Science-based forestry—long term management based on observing and replicating resilient natural processes—gives us a measure of control over chaotic natural systems, substantially reducing the risks posed by nature’s indifference.

The power of forestry and the resiliency of nature are perhaps best illustrated by this truth about Indiana forests: 52 percent of Indiana’s timber stands are less than 50 years old. They are products of decision making: a decision to let a forest grow older, thin an overly dense stand, harvest mature timber, replant an abandoned pasture or clear away trees to make room for a new housing subdivision or industrial park.

Although Indiana’s forests bear all the marks of human progress—some would say human excess—they remain havens for wildlife. But if the state’s forests were left to nature, to grow old and die, oaks and hickories, two of Indiana’s most abundant, most desirable tree species, would gradually disappear. Moreover, populations of many popular wildlife species, including deer, wild turkeys, ruffed grouse and squirrels would decline precipitously, a result of habitat loss.

About 70 percent of all wildlife species living in the central hardwood region require the kind of habitat that is found in forests less than 40 years old. This, according to the authors of *Managing Forest and Wildlife Resources*, a 1990 joint publication of the U.S. Fish & Wildlife Service/Purdue University Cooperative Extension Service. The report raises a concern for the aging of central region hardwood forests and the corresponding decline in the availability of younger forest habitats.

“A forest maturing without disturbance tends toward a

climax condition,” the authors wrote. “In a climax forest in the central hardwood region, the dominant tree species on moist fertile sites are beech and maple. This forest is characterized by an open understory containing few fruit-producing shrubs or dense shrubby areas to provide needed cover for many wildlife species. The climax forest is less diverse, and so is the number of different wildlife species it can support.”

According to the report, of an estimated 260 terrestrial vertebrate wildlife species occurring in the central hardwood region, none is currently known to require the kind of habitat found in old growth forests. For that matter, forest stands over 40 years old benefit only 30 percent of the species present. The rest prefer younger forests, like those present in Indiana today.

The solution to the aging of central region hardwood forests: management.

“[Today’s] social and economic needs no longer permit us to allow habitat diversity and forest regeneration when and where nature chooses,” the authors conclude. “Land clearing, agriculture, industrialization and urban development have placed an increased importance on the remaining forest.”

The authors see a synergism between timber management and the public’s desire to protect wildlife and wildlife habitat.

“Our advanced technologies work well with the natural compatibility of forests and wildlife,” they wrote. “Wildlife management and forest management are not mutually exclusive. [Proper] timber management can enrich wildlife populations [increasing] habitat diversity [and] the richness of plants and animals [the forest] can support.”

Although the authors believe “proper timber management does not interrupt nature’s processes,” they caution against one-size-fits-all forest management strategies, which are often the underlying cause of public disputes over harvesting methods.

“Because of the many site conditions, management objectives and stand types, no single system is best for managing hardwood stands. The proper method must be selected and used as a tool to improve a forest for wildlife habitat, recreational opportunities or timber production. Proper planning can benefit timber, wildlife, recreation and income even on small parcels of land.”



Does growth exceed harvest in Indiana's forests, and are forests replanted after harvesting?

Forest growth exceeds harvest by a wide margin in Indiana forests. In 1991, the most recent year for which detailed growth and harvest data is available, *hardwood* harvest was 64 percent of growth, while *softwood* growth was 21 times greater than harvest. **Figure 8** tracks growth and harvest for two years, 1985 and 1991.

In 1991, the Forest Service reported net growth in *hardwood* growing stock volume surpassed 144 million cubic feet, while harvest stood at 92.4 million cubic feet. The 1991 harvest was down slightly from 1985, when the reported harvest was 72 percent of growth.

As **Figure 8** shows, hardwoods dominate Indiana's forest, in both growth and harvest terms. Softwoods grow on about four percent of Indiana's forestland base, mainly on plantations in the southernmost region of the state.

The 1991 softwood harvest was 302,000 cubic feet, about one-third of one percent of the hardwood harvest. Meanwhile, softwood growth exceeded 6.4 million cubic feet, about 4.5 percent of hardwood growth.

Although it is likely positive growth and harvest trends reported in 1991 will be reaffirmed by the U.S. Forest Service's long-awaited 1998 report, the gap between growth and harvest will probably narrow, reducing the gain in sawtimber inventories recorded between 1967 and 1986. If this occurs, it will be the result of two converging trends increasing worldwide demand for fine Indiana hardwood, and a decline in the *rate of growth* in forests, which is customary as trees age.

As for replanting, when harvesting is done properly, hardwood forests quickly regenerate themselves naturally. Nevertheless, some landowners do replant after harvest as a means of accelerating yield among commercially valuable tree species, such as oak and walnut.

In Indiana, tree planting is commonly associated with reestablishing forests on croplands that were cleared years ago. Annually, the Department of Natural Resources Nursery Section distributes between four and five million seedlings, representing more than 40 different tree and shrub species. Consulting foresters are often at the forefront in the reforestation effort. Among their objectives: timber stand improvement, wildlife habitat restoration and soil and water quality protection.



What is the timber industry's economic contribution to Indiana, and what products do they manufacture?

Forest products manufacturing is a \$2.55 billion a year industry in Indiana. But the industry is concentrated in rural communities in the southern half of the state; the 56,000-plus jobs it provides statewide have gone largely unnoticed in the more economically diverse environs of northern Indiana.

Figs. 9 and 10A–C (this page and on Page 15) track the forest industry's economic contributions in several ways.

Fig. 9 displays the economic contributions for the industry's three sectors: lumber and wood products, furniture and fixtures and paper and allied products. For each sector or sub-sector, the economic contribution—also known as the *value added*—is determined by subtracting the value of shipments from the cost of materials.

Figs. 10A–C provide detailed information concerning income and employment. These charts reveal that, while Indiana's forests are located mainly in the southern half of the state, the industry's presence is felt statewide in some surprising ways. For example, (**Fig. 10C**) 80 percent of 1994 secondary wood products income and 81 percent of secondary paper income, was earned in the Northern Unit, a day's drive away from the state's forest epicenter. Equally surprising, (**Fig. 10C**) 78 percent of Indiana's secondary wood products employment, and 80 percent of its secondary paper employment, was located in the Northern Unit. Forest economists attribute Northern Unit economic activity to its proximity to Chicago, and the fact the state's mobile home, recreational vehicle and packaging industries are concentrated here.

Figs. 10B–C track *basic employment and basic income*. *Basic employment and basic income* derive their importance from the fact that certain industries, called *basic industries*, export their products or services to other regions, states or countries, thereby generating "new dollars" for the communities, regions or states in which they are located.

Without new dollars, economic growth is impossible. Indeed, the economic *strength* of a community or a state is determined by its ability to export its goods and services to other areas, thereby generating new dollars. Because Indiana's forest products industry sells its products worldwide, it is a basic industry.

By contrast, "non-basic industries" generate their revenue from *local* customers. For example, a restaurant that draws most of its customers from the community where it is located provides local employment, but does not bring new dollars into the community. The same can be said for any business that derives its income mainly from the community in which it is located. While the business may be important to its local customers, it does not bring in new dollars necessary to fuel economic growth.

Although the economic impact of Indiana's timber industry is felt statewide, some southern counties are heavily dependent on the jobs and income forest products manufacturers generate. Look again at **Fig. 10B–C**. Note that 12.4 percent of basic employment and 11.3 percent of basic income in the Knobs Unit is in secondary wood products manufacturing. A 1993 study by the Indiana Department

of Natural Resources reveals the industry is most prominent in the following counties: Dubois, Orange, Perry, Crawford, LaGrange, Harrison, Ripley, Spencer, Elkhart and Carroll.

Note secondary paper's income and employment contributions to the Northern Unit (**Fig. 10C**). There are many more consumer products made from hardwood than from softwood. In Indiana, hardwood manufacturing is far more labor intensive than softwood manufacturing, which centers around the milling of plywood, lumber and other structural materials used in residential and commercial construction.

Because there are many more steps involved in getting a hardwood product to market, the entire process involves many middlemen—*secondary manufacturers*—who may perform just *one step* in the manufacturing chain. Here's an example involving the manufacture of a simple wooden chair.

A "dimension plant" buys its lumber from a sawmill, who cut the lumber from logs, which it bought from a landowner, who may be working with a consulting forester, who had hired a logger, who contracted with a log trucker. The dimension plant cross-cuts and rip-saws the lumber it purchased from the sawmill, then sells its finished product, called a "blank," to a company that makes chairs. The chair maker further machines the blank, which it then assembles into a chair. Seven different companies were involved in the construction of this chair, which may now be finished by an eighth company, before it is assembled, finished, boxed and trucked to a wholesaler, who will sell it to a retailer.

To grasp the full impact of this extraordinarily long manufacturing chain, study **Fig. 10C**, which lists employment in both primary and secondary sectors. Note that almost 66 percent of the 56,000 jobs in Indiana's forest industry involve secondary manufacturing. Add in wood furniture manufacturing (also a secondary manufacturing activity) and the total jumps to 86.3 percent. In Indiana, most of the companies in this chain are small, family-owned businesses.

As **Fig. 10A** indicates, *manufacturing*, which includes forest products, is Indiana's main economic engine, accounting for 63.8 percent of basic employment and 81.2 percent of basic income. For their part, forest products manufacturers account for 4.3 percent of basic employment and 3.8 percent of basic income—less than the agricultural/fisheries contribution, but more than the tourism/recreation contribution.

Among the more important forest products exported from Indiana: furniture and furniture parts for residential and commercial use, lumber and plywood, millwork, flooring, veneer facing for furniture and panel products, window frames and frame parts, doors and door parts, door frames and frame parts, stair railings and stair parts, handles, barrels, cabinets and cabinet parts, pallets and pallet parts, office partitions and fixtures, pre-fabricated wood buildings, structural and decorative members used in mobile home construction, appliance cabinets, drapery hardware, shades and blinds, paperboard and cardboard boxes.

The Drive To Protect Indiana's Forests

By James D. Petersen

Indiana's Division of Forestry is stepping up its efforts to protect private forestland in the Hoosier State, and it is doing so with the full support of the state's timber industry.

The threat is urbanization, and it is particularly acute in the Indianapolis area, where thousands of acres of hardwood forest have been leveled in recent years to make room for subdivisions, shopping centers and wider highways. It is not uncommon for Indianapolis commuters to drive an hour or more daily, for the privilege of living in wooded country environs that were part of Indiana's forest only a few years ago.

"Urbanization is the biggest threat our state's forests face," declares State Forester, Burney Fischer. "We know the public shares our concern, but the fact is Indiana has a diverse and rapidly growing economy. The only way we can protect forests requires that we first convince forest landowners their woodlands have more long-term value as forests than they have as subdivisions."

Actually, Indiana's forestland base has been expanding since 1907, but progress has been painstakingly slow. There are more than 100,000 private forest landowners in Indiana, and most are unaware of the untapped potential their lands hold. Besides, when developers come calling, the lure of quick profits often overshadows the patience required to turn an untended woodlot into a productive forest.

Even so, thousands of Indiana landowners have chosen to keep their lands forested. Some want only to provide havens for wildlife, while others have discovered that even a small, well managed forest can pay handsome dividends during one's retirement years. But for an increasing number, the incentive is the state's Classified Forest Program, a 77-year-old initiative that gives forest landowners more favorable property tax treatment if they agree to keep their woodlands forested. The 1921 state legislature passed the measure to

encourage landowners to protect then existing woodlands, or plant new forests on abandoned cropland. In exchange, the state locked in a \$1 per acre property tax rate, and promised free technical assistance to participating landowners.

More Manpower Needed

"Our first objective is to retain land as forest," Dr. Fischer explains. "Once that's done, we try to persuade landowners to get involved in improving their woodlots, through thinning, occasional harvesting and, if necessary, tree planting."

The qualifications for participation in the Classified Forest Program are straight forward: the parcel must cover at least ten acres, it must be protected from fire and no buildings or livestock grazing are allowed. Periodic harvesting is permitted, indeed encouraged, but landowners must have a written management plan approved by the state.

About 6,200 Indiana forest landowners participate in the program, which now includes more than 375,000 privately owned acres. Dr. Fischer believes more landowners would sign up if the State Division of Forestry had the manpower needed to spread the word. Lenny Farlee, one of 18 district foresters employed by the Division, confirms the personnel shortage, adding that landowner turnover exacerbates the problem.

"There are probably 90,000 woodland tracts in Indiana larger than ten acres," Mr. Farlee explains. "We have a seven percent annual turnover in forestland ownership, which means 6,000 new owners every year. In a good year, we work with maybe 6,500 owners, which means we are just barely servicing the turnover. Judging from positive landowner feedback, I estimate we could double the number of acres in the Classified Program."

Dr. Fischer concedes that, even with all the additional work done by industrial and consulting foresters, the state is

reaching only a fraction of the landowners it would like to reach. Even so, he says, "I believe foresters statewide—be they private consultants, industrial foresters or state-employed foresters—would agree our Classified Forests are the most productive, best managed privately owned forestlands in the state."

Private Forests, Public Benefits

No wonder. Indiana's Division of Forestry offers forest landowners a package of free professional services not offered in most other states. Mr. Farlee and his colleagues spend almost all of their time advising participating landowners on the best ways to manage their forests. They even inventory timber stands free of charge, a service that would cost hundreds of dollars elsewhere.

"The Indiana forestry community is committed to improving the quality of private woodlands in our state," Dr. Fischer explains. "A well managed private forest produces multiple public benefits, including a visibly pleasing setting, high-quality wildlife habitat and high-quality timber, which is a staple of Indiana's forest products industry."

There are few regulations limiting what private land-owners can do with their forests in Indiana. Other than the federal Clean Water Act, which mandates water quality protection, land-owners throughout the eastern hardwood region are free to do just about anything with their land. It is a far cry from the regulatory maze that confronts private forest landowners in Oregon, Washington and California.

"I would rather be an educator than a regulator," says Dr. Fischer, noting his awareness of the regulatory climate in western timber states. "Indiana is a huge private property rights state. People don't want the government telling them what they can and can't do on their land, which is why we offer landowners the free services we provide."

We want to help them become good forest stewards, and we want to maintain the public's trust where private lands forestry is concerned."

Minimizing Harvest Impacts

As foresters go, Dr. Fischer is no shrinking violet. He holds a Ph.D. in silviculture from Purdue University, taught for a time at the University of Massachusetts at Amherst, then returned to Purdue, where he developed a continuing education program for professional foresters. Few have a more concise understanding of Indiana's forests or what is needed to protect them from misuse or overuse. And because he knows Indiana's forests so well, he has also championed a logger training program aimed at minimizing the impacts timber harvesting can have on soil and water quality. The program, called Best Management Practices (BMPs), is designed to acquaint participating loggers with things they can do on the ground to minimize the impacts that often accompany the use of heavy machinery.

Although the program is voluntary, the state has added BMP training to its umbrella Logger Safety Training Program, and according to Dr. Fischer, logger response has surpassed his expectations. "There has been no resistance to BMP training," he reports. "It's clear most of our loggers want to do the best job possible."

Indeed they do.

"We preach BMPs, and we were doing it before the state got involved," declares Greg Koontz, Vice President of Procurement for Foley Hardwoods, Bargersville. Mr. Foley's loggers got acquainted with BMPs some years ago while harvesting a U.S. Forest Service timber sale. BMPs are a Forest Service requirement.

"We were required to do some grass reseeded to help prevent erosion, and we put in water bars on our skid roads, to help direct runoff from heavy rains," Mr. Koontz recalls. "When we saw how nice the job looked, we decided to use BMPs as a sales tool on all of our logging jobs. Land-owners love it, the state loves it, and we minimize the chances of water-related environmental impacts. It's great!"

Urban Sprawl

Employee-owned Foley Hardwoods buys about six million board feet of hardwood annually, mostly from state and private forests. Mr. Koontz says the company prefers to buy state-owned timber because "the state manages its timber very well, so wood quality is much higher."

Like most Indiana mills, Foley focuses on oak, which accounts for 60 percent of the wood it mills. Yellow poplar, hickory, maple, ash, walnut and beech make up the rest. "We prefer oak because it is what our customers want," Mr. Koontz explains. "We sell mainly to domestic brokers who do business with cabinet makers, flooring manufacturers and companies that make pallets, truck flooring and mobile home parts."

Foley's 30-year-old Bargersville sawmill looks out of place, now that it sits directly across the street from a recently completed subdivision. Its presence reminds Mr. Koontz that Indianapolis has boiled over into fields and forests that only a few years ago were miles distant from the city.

"I understand their desire to live in the country," Mr. Koontz says of his new neighbors. "But I wish they were a bit more understanding of our work. People living in wood houses in subdivisions created by the permanent removal of forests ought to rethink their complaints about the very temporary visual impacts of timber harvesting."

Greening Of America

Although Indiana's Classified Forest Program and its Best Management Practices Training Program are boosting forest productivity, it is clear the state simply can't reach every forest landowner it would like to reach. But it gets a helping hand from companies like Pike Lumber, a 93-year-old Indiana hardwood manufacturer that offers private landowners a wide range of professional forestry services. In exchange for the right to harvest, the company surveys the owner's timber, prepares a written ten-year forest plan, does all the necessary thinning work, replants where needed, then buys the harvestable timber at market price. Other companies, including Kimball International, Jasper, offer similar services, and several industrial landowners offer

more limited management help.

"The program moved at a snail's pace for about 20 years, but it took off like a rocket about five years ago," reports Philip Carew, Pike's forestlands manager. Mr. Carew attributes the program's remarkable rise to "the greening of America."

"Landowners have gotten very interested in improving the quality of their forests," he says. "We are seen as professionals able to provide a high-quality service."

It would appear the company's reputation is its best sales tool. Walk-in traffic is brisk. Most who inquire are absentee landowners with 30 to 40 acres, and there is frequently a family tie to the land they own.

"Many we see inherited property from parents or grandparents," Mr. Carew explains. "We show them what their forests could look like with a little tender loving care. Periodic harvest income is the frosting on the cake."

Among the company's better known clients: The Fellowship of Christian Athletes, who own a park, and use harvest income to finance its activities; and the Boys Club of Indiana, who sought out Pike on FCA's recommendation.

Pike Lumber Company is large by Indiana sawmill standards. It processes about 11 million board feet of hardwood annually at its Akron and Carbon mills. High-quality lumber is sold to furniture, cabinet and flooring manufacturers, while the lower grades are sold to pallet makers.

About ten percent of Pike's timber comes from company-owned forests. The rest is harvested from other private ownerships. Virtually all the harvesting is done by company logging crews, who are also BMP-trained.

"The value in BMPs is a no-brainer for us," declares company logging superintendent, Jim Hill. "The fact that they are voluntary isn't an issue either. We use BMPs because they are the key to repeat business. What matters most to us is the quality of our work. Few things make a logger feel better than a happy landowner."

Nature's Resiliency

Although timber growth still exceeds harvest in Indiana, harvesting has tripled over the last 20 years, a fact observers attribute to the availability of an abundant wood supply.

"We are living off what has grown back since the last big harvest, eighty-some years ago" says Dr. William Hoover, a forest economics professor at Purdue University. "Until recently, there hasn't been much management of forests in Indiana. The fact that these forests grew back by themselves is a tribute to the resiliency of nature."

Dr. Hoover has spent years monitoring trends in Indiana's forest products industry, and he is a frequent contributor to government-funded studies of the industry and its timber supply needs.

"The industry is changing," he says. "There are fewer mills, and they are larger than they used to be. Competition is squeezing out small operators who cannot afford to invest millions of dollars in advanced milling technologies that improve utilization, while minimizing wood waste. The same trend can be observed all over the nation."

Indiana's wood manufacturing prowess is such that it is now is able to outbid timber purchasers in neighboring states. As a result, about 15 percent of its saw logs and a whopping 65 percent of its veneer logs, come from out-of-state forests, mainly in Kentucky, Pennsylvania and Ohio.

"Our secondary wood processing sector is the envy of the region," Dr. Hoover reports. "With furniture manufacturers like Kimball and Aristokraft based here, it's not hard to see why our hardwood industry has become such a powerhouse in the marketplace. By adding great value to the logs it purchases in Indiana and neighboring states, the industry makes a significant contribution to Indiana's economy."

Hardwood manufacturing is a Byzantine industry, filled with niche marketers and middlemen whose operations are very difficult to track. Indiana is no exception. Daniel Cassens, a wood products professor at Purdue, says there is "a distinct sub-culture" composed of people who do custom woodworking for other more visible manufacturers. How many are there? Nobody knows, but a trade publication called *Woodshop News* boasts a circulation of 90,000, including 45,000 "serious woodworkers."

"That means they're in business," Professor Cassens says. "Usually, you find their woodshops behind their houses. They may work alone or employ two, three or

four workers. Accurately tracking their production is impossible. We aren't even sure how much wood they use or where they buy it. But I can tell you that the amount of hardwood milled in Indiana far exceeds what is harvested from our state's forests."

Big Trees, Big Money

It may be that the most fascinating piece in this puzzle involves the *value of single trees* that occasionally reach Indiana mills.

"There are *single* trees in this state that are so valuable their owners sometimes market them through specially prepared brochures advertising their availability for harvest," Professor Cassens explains.

Valuable indeed. Dr. Cassens says such trees, though now rare, can bring forty to fifty thousand dollars in a competitive market. They are made into veneer panels—thinly sliced sheets in which the wood grains are carefully matched to make it appear the panels form a single, large piece. Usually, they adorn large lobbies or other special rooms where their striking beauty can be showcased.

The value of big trees has not gone unnoticed. In fact, several companies now actively encourage landowners to hold their timber for longer periods, allowing it to grow larger. Among them, Koetter Woodworking, a 38-year-old Borden firm that founder Tom Koetter started in his basement.

"Older trees often provide higher quality wood," explains Sam Smith, Koetter's operations manager. "Companies that are in the woodworking business, as we are, prefer higher grades, so it is our interest to encourage land-owners to allow their trees to grow larger before harvest."

Like many other Indiana wood manufacturers, Koetter buys timberland whenever it can, to assure a long term supply of high quality hardwood. It also works closely with loggers, to make certain trees are harvested in precise ways that maximize wood value.

"We don't want to waste anything," declares Mr. Smith.

But Koetter is doing something else that is likely a first in the hardwood region, if not the nation. It is investing \$4 million in a forestry education center that will allow visitors to tour its milling operation on raised catwalks. The Forest Discovery

Center, which will open in September, 1998, also features a walk-through hardwood forest and other exhibits focusing on the importance of responsible forest management.

"You will be able to follow a log from mill entry to finished product," explains company founder, Tom Koetter. "You can also watch our co-generation plant turn wood waste into steam heat, which we use to dry our lumber. We hope you will also learn some new things about the environmental advantages of wood."

It is likely no one will be more thrilled when the center opens than State Forester Fischer, who is a staunch advocate of forestry education programs.

"Public trust is essential to Indiana's forest products industry and to the State Forestry Division," he says. "I'm not afraid of people seeing timber harvesting on state or private land, because it is part of our economy and our cultural heritage. But we must do all we can to minimize the visual and environmental impacts of logging. We must be good communicators, because public understanding of the economic and environmental benefits that flow from well managed forests is vital to our business."

The Evergreen Foundation and its supporters

Funding for *Forests and Forestry in Indiana: Answers to Questions of Public Interest and Concern* was provided by the Indiana Department of Natural Resources, Division of Forestry; and Purdue University, Department of Forestry and Natural Resources, members of the Indiana Hardwood Lumbermen's Association and The Evergreen Foundation.

The Evergreen Foundation is a national, non-profit forestry education organization, dedicated to the advancement of science-based forestry. To this end, we publish *Evergreen*, a bi-monthly journal designed to keep our members, and others, abreast of issues and events impacting forestry, forest communities and the forest products industry.

Evergreen was founded in 1985, with initial funding provided by a group of Oregon lumber companies interested in promoting greater public involvement in the federal government's forest planning process. The publication has grown significantly over the years, and it is today the most widely read forestry journal in the world.

In its research and publishing activities, the Foundation works closely with forest scientists, wildlife biologists, historians, economists, forest landowners and state and federal agencies responsible for protecting the nation's forest resources.

The Foundation operates under Internal Revenue Service 501(c)(3) regulations, which govern the conduct of tax-exempt organizations created for charitable, educational, religious or scientific purposes. As such, we do not lobby or litigate. Forestry education is our only mission. Support comes from members and other non-profit organizations that share our interest in advancing public understanding of forests and forestry. For information concerning membership, write us at 5000 Cirrus Drive, Suite 201, Medford, Oregon, 97504, or telephone us at (541) 773-2247.

Postscript

In February, the Indiana Hardwood Lumbermen's Association will celebrate its 100th year of service to forestry and the forest products industry. Few lumber associations can lay claim to such a rich history. It was a strong supporter of legislation creating Indiana's state forest system in 1903, and over the years it has championed forest protection measures, and forestry research programs involving the State Division of Forestry, the U.S. Forest Service and Purdue University. We congratulate them on their first 100 years, and wish them well in the coming century.

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Volume 9 • Number 18

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